#### Cell References

Each set of [horizontal](horizontal.docx) cells in a [worksheet](worksheet.docx) is a [row](row.docx), and each set of [vertical](vertical.docx) cells is a column. A cell's [row](row.docx) and column combination designates the [location](location.docx) of that cell. [Guidance An implementation is encouraged to not unnecessarily limit the number of rows and columns in a worksheet. end guidance]

A [cell](cell.docx) [reference](reference.docx) designates one or more cells on the same worksheet. Using [references](references.docx), one can:

* Use data contained in different parts of the same [worksheet](worksheet.docx) in a single formula.
* Use the value from a single [cell](cell.docx) in several formulas.
* Refer to cells on other [sheets](sheets.docx) in the same [workbook](workbook.docx), and even to other workbooks. (References to cells in other workbooks are called links.)

A [cell](cell.docx) [reference](reference.docx) has the following form:

cell-reference:
name
[ [ [ [ [ workbook-name ] ] [ sheet-name : ] ] sheet-name ! ] A1-reference
[ [ [ [ [ workbook-name ] ] [ sheet-name : ] ] sheet-name ! ]
 A1-reference : A1-reference
[ [ [ [ [ workbook-name ] ] [ sheet-name : ] ] sheet-name ! ] R1C1-reference
[ [ [ [ [ workbook-name ] ] [ sheet-name : ] ] sheet-name ! ]
 R1C1-reference : R1C1-reference

workbook-name:
book-name-start-character [ book-name-characters ]

book-name-start-character:
any character except ', \*, [, ], :, and ?

book-name-characters:
book-name-characters book-name-character

book-name-character:
any character except \*, [, ], :, and ?

sheet-name:
sheet-name-start-character [ sheet-name-characters ]

sheet-name-start-character:
any character except ', \*, [, ], \, :, /, and ?

sheet-name-characters:
sheet-name-characters sheet-name-character

sheet-name-character:
any character except \*, [, ], \, :, /, and ?

A relative [cell](cell.docx) [reference](reference.docx) is based on the relative position of the [cell](cell.docx) that contains the [formula](formula.docx) and the [cell](cell.docx) to which the [reference](reference.docx) refers. If the position of the [cell](cell.docx) that contains the [formula](formula.docx) changes, the [reference](reference.docx) is changed along with it.

An absolute [cell](cell.docx) [reference](reference.docx) always refers to the absolute [location](location.docx) of a cell. If the position of the [cell](cell.docx) that contains the [formula](formula.docx) changes, the absolute [reference](reference.docx) remains the same.

A mixed [cell](cell.docx) [reference](reference.docx) has either an absolute column and relative [row](row.docx), or an absolute [row](row.docx) and relative column.

It is possible to process the same [cell](cell.docx) or set of cells on multiple worksheets within a [workbook](workbook.docx), using a 3-D reference. A [reference](reference.docx) of this type is made up of the [cell](cell.docx) [reference](reference.docx), preceded by a range of [worksheet](worksheet.docx) names, and an exclamation mark character (!), in that order. A 3-D reference can be used to refer to cells on other [sheets](sheets.docx), to defined names, and to create formulas by using the following functions: [AVERAGE](AVERAGE.docx), [AVERAGEA](AVERAGEA.docx), [COUNT](COUNT.docx), [COUNTA](COUNTA.docx), [MAX](MAX.docx), [MAXA](MAXA.docx), [MIN](MIN.docx), [MINA](MINA.docx), [PRODUCT](PRODUCT.docx), [STDEV](STDEV.docx), [STDEVA](STDEVA.docx), [STDEVP](STDEVP.docx), [STDEVPA](STDEVPA.docx), [SUM](SUM.docx), [VAR](VAR.docx), [VARA](VARA.docx), [VARP](VARP.docx), and [VARPA](VARPA.docx).

3-D references shall not be used in multi-cell formulas.

By default, a [cell](cell.docx) [reference](reference.docx) is understood to refer to one or more cells in the current worksheet. However, a [cell](cell.docx) [reference](reference.docx) can be preceded by its parent [worksheet](worksheet.docx) name and an exclamation mark (!), in that order. This allows cells in one [worksheet](worksheet.docx) to be referenced in another [worksheet](worksheet.docx) of the same workbook. [Example: The [cell](cell.docx) [reference](reference.docx) MonthlyTotals!D1:D12 might be used from within a sibling (or the same) [worksheet](worksheet.docx) of MonthlyTotals to refer to those 12 cells. end example]

An area is a set of rectangular-shaped contiguous cells. An area can be a single cell. [Example: A5 and B6:C10 each designate one area, and D3:D5,E12:F15 designates two areas (the comma (,) being the union operator). end example] [Note: The number of areas designated by a [cell](cell.docx) [reference](reference.docx) can be obtained by calling the function [AREAS](AREAS.docx) (§). end note]

There are two [cell](cell.docx) [reference](reference.docx) styles: A1 (§) and R1C1 (§).

##### A1-Style Cell References

A [cell](cell.docx) [reference](reference.docx) using the A1 reference style has the following form:

A1-reference:
A1-column
A1-row
A1-column A1-row

A1-column:
A1-relative-column
A1-absolute-column

A1-relative-column:
A Latin letter A–Z
The Latin letters AA–AZ, BA–BZ, …, ZA–ZZ, AAA-AAZ, ABA–ABZ, …, and so on

A1-absolute-column:
$ A1-relative-column

A1-row:
A1-relative-row
A1-absolute-row

A1-relative-row:
A positive decimal number

A1-absolute-row:
$ relative-row

In this style, each [row](row.docx) has a numeric heading numbered sequentially from the top down, starting at 1. Each column has an alphabetic heading named sequentially from left-to-right, A–Z, then AA–AZ, BA–BZ, …, ZA–ZZ, AAA–AAZ, ABA–ABZ, and so on. Column letters are not case-sensitive.

A relative [reference](reference.docx) to a single [cell](cell.docx) is written as its column letter immediately followed by its [row](row.docx) number. A relative [reference](reference.docx) to a whole [row](row.docx) is written as its [row](row.docx) number. A relative [reference](reference.docx) to a whole column is written as its column letter. A [reference](reference.docx) to a range of two or more cells is written as two single-cell [references](references.docx) separated by the binary range operator (:). An absolute A1 reference is made up of a cell's column letter followed by its [row](row.docx) number, with each being preceded by a dollar character ($). [Example: A2, B34, and B5:D8 are relative A1 references. $A$2, $B$34, and $B$5:$D$8 are absolute A1 references. $A2, B$34, and $B5:D$8 are mixed A1 references. end example]

[Example: SUM(Sheet2:Sheet13!B5) adds all the values contained in cell B5 on all the worksheets between and including Sheet2 and Sheet13. end example]

For rules on how deal with potential ambiguities between [cell](cell.docx) [references](references.docx) and defined names, see §.

##### R1C1-Style Cell Reference

A [cell](cell.docx) [reference](reference.docx) using the R1C1 reference style has the following form:

R1C1-reference:
R1C1-row
R1C1-column
R1C1-row R1C1-column

R1C1-row:
R1C1-relative-row
R1C1-absolute-row

R1C1-relative-row:
R [ R1C1-relative-number ]

R1C1-absolute-row:
R
R R1C1-absolute-number

R1C1-column:
R1C1-relative-column
R1C1-absolute-column

R1C1-relative-column:
C [ R1C1-relative-number ]

R1C1-absolute-column:
C
C R1C1-absolute-number

R1C1-relative-number:
An optionally signed decimal number

R1C1-absolute-number:
A positive decimal number

In this style, each [row](row.docx) has a numeric heading numbered sequentially from the top down, starting at 1. Each column has a numeric heading numbered sequentially from left-to-right, starting at 1.

A whole [row](row.docx) is referenced by omitting the column, and a whole column is referenced by omitting the row. An absolute [row](row.docx) or column [reference](reference.docx) uses absolute [row](row.docx) or column numbers, respectively. A relative [row](row.docx) or column [reference](reference.docx) uses, respectively, [row](row.docx) or column offsets from the [cell](cell.docx) containing the [formula](formula.docx), with a negative offset indicating a [row](row.docx) to the left or a column above, and a positive offset indicateing a [row](row.docx) to the right or a column below. Specifying an offset of zero is equivalent to omitting that offset and its delimiting brackets. [Example: R[-2]C refers to the [cell](cell.docx) two rows up and in the same column, R[2]C[2] refers to the [cell](cell.docx) two rows down and two columns to the right, R2C2 refers to the [cell](cell.docx) in the second [row](row.docx) and in the second column, R[-1] refers to the entire [row](row.docx) above the active [cell](cell.docx), and R refers to the current row. end example]

The R1C1 alternate [reference](reference.docx) style can only be used at runtime. See § for XML-related details.